IN THE CLAIMS

Please enter the Amendments to Claims 1, 5 & 7, and Allow all Claims 1 - 15.

1. (currently amended):: A system for monitoring change in:

the intensity of; and/or
the ratio of and/or
the phase between orthogonal components in;

a spectroscopic beam of electromagnetic radiation which is caused by interaction with a material system;

said system comprising at least one lens which is of multiple element construction and positioned so that beam of electromagnetic radiation transmits therethrough, wherein, at least two elements thereof are made from different materials, such that in use the focal length for each wavelength in a range of wavelengths is within an acceptable range of focal lengths;

said at least one multiple element lens being characterized by at least one selection from the group consisting of:

a) the focal length is between forty and forty-one millimeters over a range of wavelengths of at least two-hundred to seven-hundred nanometers;

b) the focal length varies by less than five (5%) percent over a range of wavelengths of between two-hundred and five-hundred nanometers; and

c) the spot diameter at the focal length is less than seventy-five microns over a range of wavelengths of at least two-hundred to seven-hundred nanometers;

said system further comprising at least one compensator positioned so that beam of electromagnetic radiation transmits therethrough, said compensator being characterized by a selection from the group consisting of:

said at least one compensator produces a retardence of between seventy-five (75) and one-hundred-thirty (130) degrees over a range of wavelengths defined by a selection from the group consisting of:

a[[.]]) between one-hundred-ninety (190) and seven-hundred-fifty (750) nanometers;

b[[.]]) between two-hundred-forty-five (245) and nine-hundred (900) nanometers;

c[[.]]) between three-hundred-eighty (380) and seventeen-hundred (1700) nanometers;

d[[.]]) within a range of wavelengths defined by a maximum wavelength (MAXW) and a minimum wavelength (MINW) wherein the ratio of (MAXW)/(MINW) is at least one-and-eight-tenths (1.8); and

said at least one compensator produces a retardation between thirty (30.0) and less than one-hundred-thirty-five (135) degrees over a range of wavelengths specified from MINW to MAXW by a selection from the group consisting of:

a[[.]]) MINW less than/equal to one-hundred-ninety (190) and MAXW greater than/equal to seventeen-hundred (1700);

b[[.]]) MINW less than/equal to two-hundred-twenty (220) and MAXW greater than/equal to one-thousand (1000) nanometers;

c[[.]]) within a range of wavelengths defined by a maximum wavelength (MAXW) and a minimum wavelength (MINW) range where (MAXW)/(MINW) is at least four-and one-half (4.5).

2. (original): A system as in Claim 1, in which said at least one multiple element lens demonstrates birefringence.

3. (original): A system as in Claim 1, in which said at least one multiple element lens comprises at least two elements which are made from different materials independently selected from the group consisting of:

CaF_2;
BaF_2;
LiF;
MgF_2;
fused silica;
a void region;
a gas filled region;
a liquid filled region; and
a functional equivalent to a void region.

4. (original): A system as in Claim 1 in which, during data

collection, said at least one compensator is caused to perform motion selected from the group consisting of:

continuously rotates; and
sequentially rotates through a plurality of discrete angles;

around an axis defined by the locus of the spectroscopic electromagnetic beam as it transmits therethrough.

5. (currently amended): A spectroscopic ellipsometer system comprising:

a source of polychromatic electromagnetic radiation;
a polarizer which remains fixed in position during data acquisition;
a stage for supporting a sample system;
an analyzer which remains fixed in position during data acquisition; and
a multi-element spectroscopic detector system;

said spectroscopic ellipsometer system further comprising at least one rotating or rotatable compensator means for discretely, sequentially, modifying a polarization state of a beam of electromagnetic radiation provided by said source of polychromatic electromagnetic radiation through a plurality of polarization states, said rotating or rotatable means for discretely, sequentially, modifying a polarization state of a beam of electromagnetic radiation provided by said source of polychromatic electromagnetic radiation through a plurality of polarization states being present at at least one location selected from the group consisting of:

between said polarizer and said stage for supporting a sample system; and

between said stage for supporting a sample system and said analyzer;

and positioned so that said beam of electromagnetic radiation transmits therethrough in use;

said spectroscopic ellipsometer system further comprising at least one multiple element lens present at at least one location selected from the group consisting of:

between said polarizer and said stage for supporting a sample system; and

between said stage for supporting a sample system and said analyzer;

and positioned so that said beam of electromagnetic radiation transmits therethrough in use;

<u>said spectroscopic ellipsometer system further comprising a multi-element focusing lens located:</u>

<u>between said polarizer and said stage for supporting a sample system; and</u>

said at least one compensator means comprising at least one rotatable compensator selected from the group consisting of:

a) a selection from the group consisting of:

a single element compensator; and

a multiple element compensator;

b) a compensator comprised of at least two per se. zero-order waveplates (MOA) and (MOB), said per se. zero-order waveplates (MOA) and (MOB) having their respective fast axes rotated to a position offset from zero or ninety degrees with respect to one another, with a nominal value being forty-five degrees;

c) a compensator comprised of a combination of at least a first (ZO1) and a second (ZO2) effective zero-order wave plate, said first (ZO1) effective zero-order wave plate being comprised of two multiple order waveplates (MOA1) and (MOB1) which are combined with the fast axes thereof oriented at a nominal ninety degrees to one another, and said second (ZO2) effective zero-order wave plate being comprised of two multiple order waveplates (MOA2) and (MOB2) which are combined with the fast axes thereof oriented at a nominal ninety degrees to one another; the fast axes (FAA2) and (FAB2) of the multiple order waveplates (MOA2) and (MOB2) in said second effective zero-order wave plate (ZO2) being rotated to a position at a nominal forty-five degrees to the fast axes (FAA1) and (FAB1), respectively, of the multiple order waveplates (MOA1) and (MOB1) in said first effective zero-order waveplate (ZO1);

d) a compensator comprised of a combination of at least a first (ZO1) and a second (ZO2) effective zero-order wave plate, said first (ZO1) effective zero-order wave plate being comprised of two multiple order waveplates (MOA1) and (MOB1) which are combined with the fast axes thereof

oriented at a nominal ninety degrees to one another, and said second (ZO2) effective zero-order wave plate being comprised of two multiple order waveplates (MOA2) and (MOB2) which are combined with the fast axes thereof oriented at a nominal ninety degrees to one another; the fast axes (FAA2) and (FAB2) of the multiple order waveplates (MOA2) and (MOB2) in said second effective zero-order wave plate (ZO2) being rotated to a position away from zero or ninety degrees with respect to the fast axes (FAA1) and (FAB1), respectively, of the multiple order waveplates (MOA1) and (MOB1) in said first effective zero-order waveplate (ZO1);

e) a compensator comprised of at least one zero-order waveplate, ((MOA) or (MOB)), and at least one effective zero-order waveplate, ((ZO2) or (ZO1) respectively), said effective zero-order wave plate, ((ZO2) or (ZO1)), being comprised of two multiple order waveplates which are combined with the fast axes thereof oriented at a nominal ninety degrees to one another, the fast axes of the multiple order waveplates in said effective zero-order wave plate, ((ZO2) or (ZO1)), being rotated to a position away from zero or ninety degrees with respect to the fast axis of the zero-order waveplate, ((MOA) or (MOB));

f) a compensator system comprised of a first triangular shaped element, which as viewed in side elevation presents with first and second sides which project to the left and right and downward from an upper point, which first triangular shaped element first and second sides have reflective outer surfaces; said retarder system further comprising a second triangular shaped element which as viewed in side elevation presents with first and second sides which project to the left and right and downward from an upper point, said second triangular shaped element being made of

material which provides reflective interfaces on first and second sides inside thereof; said second triangular shaped element being oriented with respect to the first triangular shaped element such that the upper point of said second triangular shaped element is oriented essentially vertically directly above the upper point of said first triangular shaped element; such that in use an input electromagnetic beam of radiation caused to approach one of said first and second sides of said first triangular shaped element along an essentially horizontally oriented locus, is caused to externally reflect from an outer surface thereof and travel along a locus which is essentially upwardly vertically oriented, then enter said second triangular shaped element and essentially totally internally reflect from one of said first and second sides thereof, then proceed along an essentially horizontal locus and essentially totally internally reflect from the other of said first and second sides and proceed along an essentially downward vertically oriented locus, then externally reflect from the other of said first and second sides of said first triangular shaped elements and proceed along an essentially horizontally oriented locus which is undeviated and undisplaced from the essentially horizontally oriented locus of said input beam of essentially horizontally oriented electromagnetic radiation; with a result being that retardation is entered between orthogonal components of said input electromagnetic beam of radiation;

g) a compensator system comprised of, as viewed in upright side elevation, first and second orientation adjustable mirrored elements which each have reflective surfaces; said compensator system further comprising a third element which, as viewed in upright side elevation, presents with first and

second sides which project to the left and right and downward from an upper point, said third element being made of material which provides reflective interfaces on first and second sides inside thereof; said third element being oriented with respect to said first and second orientation adjustable mirrored elements such that in use an input electromagnetic beam of radiation caused to approach one of said first and second orientation adjustable mirrored elements along an essentially horizontally oriented locus, is caused to externally reflect therefrom and travel along a locus which is essentially upwardly vertically oriented, then enter said third element and essentially totally internally reflect from one of said first and second sides thereof, then proceed along an essentially horizontal locus and essentially totally internally reflect from the other of said first and second sides and proceed along an essentially downward vertically oriented locus, then reflect from the other of said first and second orientation adjustable mirrored elements and proceed along an essentially horizontally oriented propagation direction locus which is essentially undeviated and undisplaced from the essentially horizontally oriented propagation direction locus of said input beam of essentially horizontally oriented electromagnetic radiation; with a result being that retardation is entered between orthogonal components of said input electromagnetic beam of radiation;

h) a compensator system comprised of a parallelogram shaped element which, as viewed in side elevation, has top and bottom sides parallel to one another, both said top and bottom sides being oriented essentially horizontally, said retarder system also having right and left sides parallel to one another, both said right and left sides being oriented at an angle to horizontal, said retarder being made of a

material with an index of refraction greater than that of a surrounding ambient; such that in use an input beam of electromagnetic radiation caused to enter a side of said retarder selected from the group consisting of:

right and left;

along an essentially horizontally oriented locus, is caused to diffracted inside said retarder system and follow a locus which causes it to essentially totally internally reflect from internal interfaces of both said top and bottom sides, and emerge from said retarder system from a side selected from the group consisting of:

left and right respectively;

along an essentially horizontally oriented locus which is undeviated and undisplaced from the essentially horizontally oriented locus of said input beam of essentially horizontally oriented electromagnetic radiation; with a result being that retardation is entered between orthogonal components of said input electromagnetic beam of radiation;

i) a compensator system comprised of first and second triangular shaped elements, said first triangular shaped element, as viewed in side elevation, presenting with first and second sides which project to the left and right and downward from an upper point, said first triangular shaped element further comprising a third side which is oriented essentially horizontally and which is continuous with, and present below said first and second sides; and said second triangular shaped element, as viewed in side elevation, presenting with first and second sides which project to the

left and right and upward from an upper point, said second triangular shaped element further comprising a third side which is oriented essentially horizontally and which is continuous with, and present above said first and second sides; said first and second triangular shaped elements being positioned so that a rightmost side of one of said first and second triangular shaped elements is in contact with a leftmost side of the other of said first and second triangular shaped elements over at least a portion of the lengths thereof; said first and second triangular shaped elements each being made of material with an index of refraction greater than that of a surrounding ambient; such that in use an input beam of electromagnetic radiation caused to enter a side of a triangular shaped element selected from the group consisting of:

first and second;

not in contact with said other triangular shape element, is caused to diffracted inside said retarder and follow a locus which causes it to essentially totally internally reflect from internal interfaces of said third sides of each of said first and second triangular shaped elements, and emerge from a side of said triangular shaped element selected from the group consisting of:

second and first;

not in contact with said other triangular shape element, along an essentially horizontally oriented locus which is undeviated and undisplaced from the essentially horizontally oriented locus of said input beam of essentially horizontally oriented electromagnetic radiation; with a result being that retardation is entered between orthogonal components of said

input electromagnetic beam of radiation;

j) a compensator system comprised of a triangular shaped element, which as viewed in side elevation presents with first and second sides which project to the left and right and downward from an upper point, said retarder system further comprising a third side which is oriented essentially horizontally and which is continuous with, and present below said first and second sides; said retarder system being made of a material with an index of refraction greater than that of a surrounding ambient; such that in use a an input beam of electromagnetic radiation caused to enter a side of said retarder system selected from the group consisting of:

first and second;

along an essentially horizontally oriented locus, is caused to diffracted inside said retarder system and follow a locus which causes it to essentially totally internally reflect from internal interface of said third sides, and emerge from said retarder from a side selected from the group consisting of:

second and first respectively;

along an essentially horizontally oriented locus which is undeviated and undisplaced from the essentially horizontally oriented locus of said input beam of essentially horizontally oriented electromagnetic radiation; with a result being that retardation is entered between orthogonal components of said input electromagnetic beam of radiation;

k) a compensator system comprised of first and second

Berek-type retarders which each have an optical axes essentially perpendicular to a surface thereof, each of which first and second Berek-type retarders has a fast axis, said fast axes in said first and second Berek-type retarders being oriented in an orientation selected from the group consisting of:

parallel to one another; and
other than parallel to one another;

said first and second Berek-type retarders each presenting with first and second essentially parallel sides, and said first and second Berek-type retarders being oriented, as viewed in side elevation, with first and second sides of one Berek-type retarder being oriented other than parallel to first and second sides of the other Berek-type retarder; such that in use an incident beam of electromagnetic radiation is caused to impinge upon one of said first and second Berek-type retarders on one side thereof, partially transmit therethrough then impinge upon the second Berek-type retarder, on one side thereof, and partially transmit therethrough such that a polarized beam of electromagnetic radiation passing through both of said first and second Berek-type retarders emerges from the second thereof in a polarized state with a phase angle between orthogonal components therein which is different than that in the incident beam of electromagnetic radiation, and in a propagation direction which is essentially undeviated and undisplaced from the incident beam of electromagnetic radiation; with a result being that retardation is entered between orthogonal components of said input electromagnetic beam of radiation;

1) a compensator system comprised of first and second Berek-type retarders which each have an optical axes essentially perpendicular to a surface thereof, each of which first and second Berek-type retarders has a fast axis, said fast axes in said first and second Berek-type retarders being oriented other than parallel to one another; said first and second Berek-type retarders each presenting with first and second essentially parallel sides, and said first and second Berek-type retarders being oriented, as viewed in side elevation, with first and second sides of one Berek-type retarder being oriented other than parallel to first and second sides of the other Berek-type retarder; such that in use an incident beam of electromagnetic radiation is caused to impinge upon one of said first and second Berek-type retarders on one side thereof, partially transmit therethrough then impinge upon the second Berek-type retarder, on one side thereof, and partially transmit therethrough such that a polarized beam of electromagnetic radiation passing through both of said first and second Berek-type retarders emerges from the second thereof in a polarized state with a phase angle between orthogonal components therein which is different than that in the incident beam of electromagnetic radiation, and in a propagation direction which is essentially undeviated and undisplaced from the incident beam of electromagnetic radiation, said compensator system further comprising third and forth Berek-type retarders which each have an optical axes essentially perpendicular to a surface thereof, each of which third and forth Berek-type retarders has a fast axis, said fast axes in said third and forth Berek-type retarders being oriented other than parallel to one another, said third and forth Berek-type retarders each presenting with first and second essentially parallel sides, and said third and forth Berek-type retarders being oriented, as viewed in side

elevation, with first and second sides of one of said third and forth Berek-type retarders being oriented other than parallel to first and second sides of said forth Berek-type retarder; such that in use an incident beam of electromagnetic radiation exiting said second Berek-type retarder is caused to impinge upon said third Berek-type retarder on one side thereof, partially transmit therethrough then impinge upon said forth Berek-type retarder on one side thereof, and partially transmit therethrough such that a polarized beam of electromagnetic radiation passing through said first, second, third and forth Berek-type retarders emerges from the forth thereof in a polarized state with a phase angle between orthogonal components therein which is different than that in the incident beam of electromagnetic radiation caused to impinge upon the first side of said first Berek-type retarder, and in a direction which is essentially undeviated and undisplaced from said incident beam of electromagnetic radiation; with a result being that retardation is entered between orthogonal components of said input electromagnetic beam of radiation;

m) a compensator system comprised of first, second, third and forth Berek-type retarders which each have an optical axes essentially perpendicular to a surface thereof, each of which first and second Berek-type retarders has a fast axis, said fast axes in said first and second Berek-type retarders being oriented essentially parallel to one another; said first and second Berek-type retarders each presenting with first and second essentially parallel sides, and said first and second Berek-type retarders being oriented, as viewed in side elevation, with first and second sides of one Berek-type retarder being oriented other than parallel to first and second sides of the other Berek-type retarder; such that in

use an incident beam of electromagnetic radiation is caused to impinge upon one of said first and second Berek-type retarders on one side thereof, partially transmit therethrough then impinge upon the second Berek-type retarder, on one side thereof, and partially transmit therethrough such that a polarized beam of electromagnetic radiation passing through both of said first and second Berek-type retarders emerges from the second thereof in a polarized state with a phase angle between orthogonal components therein which is different than that in the incident beam of electromagnetic radiation, and in a propagation direction which is essentially undeviated and undisplaced from the incident beam of electromagnetic radiation; each of which third and forth Berek-type retarders has a fast axis, said fast axes in said third and forth Berek-type retarders being oriented essentially parallel to one another but other than parallel to the fast axes of said first and second Berek-type retarders, said third and forth Berek-type retarders each presenting with first and second essentially parallel sides, and said third and forth Berek-type retarders being oriented, as viewed in side elevation, with first and second sides of one of said third and forth Berek-type retarders being oriented other than parallel to first and second sides of said forth Berek-type retarder; such that in use an incident beam of electromagnetic radiation exiting said second Berek-type retarder is caused to impinge upon said third Berek-type retarder on one side thereof, partially transmit therethrough then impinge upon said forth Berek-type retarder on one side thereof, and partially transmit therethrough such that a polarized beam of electromagnetic radiation passing through said first, second, third and forth Berek-type retarders emerges from the forth thereof in a polarized state with a phase angle between orthogonal components therein which is

different than that in the incident beam of electromagnetic radiation caused to impinge upon the first side of said first Berek-type retarder, and in a direction which is essentially undeviated and undisplaced from said incident beam of electromagnetic radiation; with a result being that retardation is entered between orthogonal components of said input electromagnetic beam of radiation;

said compensator causing essentially no deviation or displacement in a polychromatic beam of electromagnetic radiation caused to pass therethrough while caused to rotate.

6. (original): A spectroscopic ellipsometer system as in Claims 5 in which said at least one multi-element lens demonstrates bi-refringence.

7. (currently amended): A spectroscopic ellipsometer system as in Claim 5 in which comprises multi-element lens located both:

a focusing lens between said polarizer and said stage for supporting a sample system; and

a collimating lens between said stage for supporting a sample system and said analyzer;

wherein each of said lenses comprise at least two elements which are made from different materials, such that in use the focal length for each wavelength in a range of wavelengths is within an acceptable range of focal lengths, wherein said input and output lenses are characterized by a selection from the group consisting of:

both demonstrate birefringence; and

one thereof demonstrates birefringence and the other not;

said multi-element lenses being characterized by a selection from the group consisting of:

a) at least one thereof comprises:

two sequentially oriented elements, one of said two sequentially oriented elements being of a shape and orientation which individually diverges a beam of electromagnetic radiation caused to pass therethrough, and the other being of a shape and orientation which individually converges a beam of electromagnetic radiation caused to pass therethrough; there being a region between said at least two elements such that, in use, a beam of electromagnetic radiation sequentially passes through one of said at least two elements, then said region therebetween, and then the other of said at least two elements before emerging as an effectively converged, focused, beam of electromagnetic radiation[[.]];

b) at least one thereof comprises:

a sequential combination of a bi-convex element and a bi-concave element.

c) at least one thereof comprises:

a sequential combination of a bi-concave element and a bi-convex element.

d) at least one thereof comprises:

a sequential combination of a bi-convex element and a plano-concave element with said concave side of said plano-concave element adjacent to said bi-convex element.

e) at least one thereof comprises:

a sequential combination of a bi-convex element and a plano-concave element with said essentially flat side of said plano-concave element being adjacent to said bi-convex element;

f) at least one thereof comprises:

a sequential combination of a plano-concave element and a bi-convex element with said essentially flat side of said plano-concave element adjacent to said bi-concave element;

g) at least one thereof comprises:

a sequential combination of a plano-concave element and bi-convex element with said concave side of said plano-concave element adjacent to said bi-convex element;

h) at least one thereof comprises:

a sequential combination of a plano-convex element and a bi-concave element with said essentially flat side of said plano-convex element adjacent to said bi-concave element;

i) at least one thereof comprises:

a sequential combination of a bi-concave element with a plano-convex element with said convex side of said plano-convex element adjacent to said bi-concave element;

j) at least one thereof comprises:

a sequential combination of a plano-concave element and a plano-convex element with the essentially flat side of said plano-concave element being adjacent to the convex side of the plano-convex element;

k) at least one thereof comprises:

a sequential combination of a plano-concve element and a plano-convex element with the essentially flat side of said planoconcave element being adjacent to the flat side of said plano-convex element;

l) at least one thereof comprises:

a sequential combination of a plano-convex element and a plano-concave element with the essentially flat side of said plano-covex element and the essentially flat side of said plano-concave element being adjacent to one another;

m) at least one thereof comprises:

a sequential combination of a plano-concave element and a plano-convex element with the concave side of said

plano-concave element being adjacent to the convex side of the plano-convex element;

n) at least one thereof comprises:

a sequential combination of a plano-convex element bi-concave element with said convex side of said plano-convex element adjacent to said bi-concave element;

o) at least one thereof comprises:

a sequential combination of a bi-concave element and a plano-convex element with said essentially flat side of said plano-convex element adjacent to said bi-concave element;

p) at least one thereof comprises:

a sequential combination of a plano-convex element and a plano-concave element with said convex side of said plano-convex element adjacent to the concave side of the plano-concave element;

q) at least one thereof comprises:

a sequential combination of a plano-concave element and a plano-convex element with said essentially flat side of said plano-concave element being adjacent to the essentially convex side of the plano-convex element;

r) at least one thereof comprises:

a sequential combination of a plano-convex element and

a plano-concave element with said convex side of said plano-convex element being adjacent to the essentially flat side of the plano-concave element;

s) at least one thereof comprises:

a sequential combination of a plano-concave element with a plano-convex element with the essentially flat side of said plano-convex element being adjacent to the concave side of said plano-concave element;

t) at least one thereof comprises a selection from the group consisting of:

a sequential combination of a converging element and a diverging element;

a sequential combination of a diverging element and a converging element;

a sequential combination of a converging element, a diverging element, a converging element and a diverging element;

a sequential combination of a converging element, a diverging element, a diverging element and a converging element;

a sequential combination of a diverging element, a converging element, a diverging element and a converging element;

a sequential combination of a diverging element, a

converging element, a converging element and a diverging element;

a sequential combination of two converging elements and a diverging element;

a sequential combination of two diverging elements and a converging element;

a sequential combination of a diverging element and two converging elements;

a sequential combination of a converging and two diverging elements;

a sequential combination of a diverging, converging and diverging elements;

a sequential combination of a two converging and two diverging elements;

a sequential combination of a two diverging and two converging elements;

a sequential combination of a converging, diverging and converging elements;

u) at least one thereof comprises:

two elements with a region therebetween, wherein said region between said at least two elements has the optical properties of a selection from the group consisting of:

a void region;
a gas filled region;
a liquid filled region; and
a functional equivalent to a void region;

v) at least one thereof comprises:

at least two elements which are made from different materials independently selected from the group consisting of:

CaF_2;
BaF_2;
LiF;
MgF_2; and
fused silica;

and wherein each of said at least two elements are individually selected to be made of different materials;

w) at least one thereof is characterized by at least one selection from the group consisting of:

a) the focal length is between forty and forty-one millimeters over a range of wavelengths of at least two-hundred to seven-hundred nanometers;

b) the focal length varies by less than five (5%) percent over a range of wavelengths of between two-hundred and five-hundred nanometers; and

c) the spot diameter at the focal length is less than seventy-five microns over a range of wavelengths of at

least two-hundred to seven-hundred nanometers;

x) at least one thereof comprises:

an element made of a selection from the group consisting of:

CaF_2; and
fused silica;

y) at least one thereof:

is made of two elements, one of said elements being made of fused silica and the other of CaF_2;

z) at least one thereof comprises:

a converging element selected from the group consisting of:

a positive miniscus;
an asymetric convex;

and/or a diverging element selected from the group consisting of:

a negative miniscus;
an asymetric concave.

8. (original): A spectroscopic ellipsometer sequentially comprising:

a) a source of a spectroscopic beam electromagnetic radiation;

b) a polarizer element;

in either order elements c and d:

c) optionally a rotating or rotatable compensator element;

d) a multiple element input lens in which one element comprise liquid between two solid elements;

e) a material system;

in either order elements f and g:

f) a multiple element input lens in which one element comprise liquid between two solid elements;

g) optionally a rotating or rotatable compensator element;

h) an analyzer element; and

i) a spectroscopic detector System;

at least one of said optional rotating or rotatable compensator elements in c or g being present and oriented so that a spectroscopic electromagnetic beam provided by the source thereof transmits therethrough along its axis of rotation.

9. (original): A spectroscopic ellipsometer as in Claim 8 which further comprises beam directing means and/or windows located at least one selection from the group consisting of:

a) between said source of a spectroscopic beam electromagnetic radiation and said material system; and

b) between said material system and said detector system.

10. (original): A spectroscopic ellipsometer system comprising a source of a polychromatic beam of electromagnetic radiation, a polarizer, a stage for supporting a material system, an analyzer, a dispersive optics and at least one detector system which comprises a multiplicity of detector elements, said spectroscopic ellipsometer system further comprising at least one compensator(s) positioned at a location selected from the group consisting of:

before said stage for supporting a material system;

after said stage for supporting a material system; and

both before and after said stage for supporting a material system;

such that when said spectroscopic ellipsometer system is used to investigate a material system present on said stage for supporting a material system at least one of said at least one compensator(s) is caused to continuously rotate while a polychromatic beam of electromagnetic radiation produced by said source of a polychromatic beam of electromagnetic radiation is caused to pass through said polarizer and said at least one compensator(s), said polychromatic beam of electromagnetic radiation being also caused to interact with a material system on said stage for supporting a material system, pass through said

analyzer and interact with said dispersive optics such that a multiplicity of essentially single wavelengths are caused to simultaneously enter a corresponding multiplicity of detector elements in said at least one detector system;

said spectroscopic ellipsometer system further comprising at least one multiple element lens present at at least one location selected from the group consisting of:

> between said polarizer and said stage for supporting a sample system; and
>
> between said stage for supporting a sample system and said analyzer;

and positioned so that said beam of electromagnetic radiation transmits therethrough in use.

11. (original): A spectroscopic ellipsometer system as in Claim 10, in which said at least one multi-element lenses is characterized by a selection from the group consisting of:

a) at least one thereof comprises:

> two sequentially oriented elements, one of said two sequentially oriented elements being of a shape and orientation which individually diverges a beam of electromagnetic radiation caused to pass therethrough, and the other being of a shape and orientation which individually converges a beam of electromagnetic radiation caused to pass therethrough; there being a region between said at least two elements such that, in use, a beam of electromagnetic radiation sequentially

passes through one of said at least two elements, then said region therebetween, and then the other of said at least two elements before emerging as an effectively converged, focused, beam of electromagnetic radiation.

b) at least one thereof comprises:

a sequential combination of a bi-convex element and a bi-concave element.

c) at least one thereof comprises:

a sequential combination of a bi-concave element and a bi-convex element.

d) at least one thereof comprises:

a sequential combination of a bi-convex element and a plano-concave element with said concave side of said plano-concave element adjacent to said bi-convex element.

e) at least one thereof comprises:

a sequential combination of a bi-convex element and a plano-concave element with said essentially flat side of said plano-concave element being adjacent to said bi-convex element;

f) at least one thereof comprises:

a sequential combination of a plano-concave element and a bi-convex element with said essentially flat side of

said plano-concave element adjacent to said bi-concave element;

g) at least one thereof comprises:

a sequential combination of a plano-concave element and bi-convex element with said concave side of said plano-concave element adjacent to said bi-convex element;

h) at least one thereof comprises:

a sequential combination of a plano-convex element and a bi-concave element with said essentially flat side of said plano-convex element adjacent to said bi-concave element;

i) at least one thereof comprises:

a sequential combination of a bi-concave element with a plano-convex element with said convex side of said plano-convex element adjacent to said bi-concave element;

j) at least one thereof comprises:

a sequential combination of a plano-concave element and a plano-convex element with the essentially flat side of said plano-concave element being adjacent to the convex side of the plano-convex element;

k) at least one thereof comprises:

a sequential combination of a plano-concve element and

a plano-convex element with the essentially flat side of said planoconcave element being adjacent to the flat side of said plano-convex element;

l) at least one thereof comprises:

a sequential combination of a plano-convex element and a plano-concave element with the essentially flat side of said plano-covex element and the essentially flat side of said plano-concave element being adjacent to one another;

m) at least one thereof comprises:

a sequential combination of a plano-concave element and a plano-convex element with the concave side of said plano-concave element being adjacent to the convex side of the plano-convex element;

n) at least one thereof comprises:

a sequential combination of a plano-convex element bi-concave element with said convex side of said plano-convex element adjacent to said bi-concave element;

o) at least one thereof comprises:

a sequential combination of a bi-concave element and a plano-convex element with said essentially flat side of said plano-convex element adjacent to said bi-concave element;

p) at least one thereof comprises:

a sequential combination of a plano-convex element and a plano-concave element with said convex side of said plano-convex element adjacent to the concave side of the plano-concave element;

q) at least one thereof comprises:

a sequential combination of a plano-concave element and a plano-convex element with said essentially flat side of said plano-concave element being adjacent to the essentially convex side of the plano-convex element;

r) at least one thereof comprises:

a sequential combination of a plano-convex element and a plano-concave element with said convex side of said plano-convex element being adjacent to the essentially flat side of the plano-concave element;

s) at least one thereof comprises:

a sequential combination of a plano-concave element with a plano-convex element with the essentially flat side of said plano-convex element being adjacent to the concave side of said plano-concave element;

t) at least one thereof comprises a selection from the group consisting of:

a sequential combination of a converging element and a diverging element;

a sequential combination of a diverging element and a converging element;

a sequential combination of a converging element, a diverging element, a converging element and a diverging element;

a sequential combination of a converging element, a diverging element, a diverging element and a converging element;

a sequential combination of a diverging element, a converging element, a diverging element and a converging element;

a sequential combination of a diverging element, a converging element, a converging element and a diverging element;

a sequential combination of two converging elements and a diverging element;

a sequential combination of two diverging elements and a converging element;

a sequential combination of a diverging element and two converging elements;

a sequential combination of a converging and two diverging elements;

a sequential combination of a diverging, converging and diverging elements;

a sequential combination of a two converging and two diverging elements;

a sequential combination of a two diverging and two converging elements;

a sequential combination of converging, diverging and converging elements;

u) at least one thereof comprises:

two elements with a region therebetween, wherein said region between said at least two elements has the optical properties of a selection from the group consisting of:

a void region;
a gas filled region;
a liquid filled region; and
a functional equivalent to a void region;

v) at least one thereof comprises:

at least two elements which are made from different materials independently selected from the group consisting of:

CaF_2;
BaF_2;
LiF;
MgF_2; and
fused silica;

and wherein each of said at least two elements are individually selected to be made of different materials;

w) at least one thereof is characterized by at least one selection from the group consisting of:

a) the focal length is between forty and forty-one millimeters over a range of wavelengths of at least two-hundred to seven-hundred nanometers;

b) the focal length varies by less than five (5%) percent over a range of wavelengths of between two-hundred and five-hundred nanometers; and

c) the spot diameter at the focal length is less than seventy-five microns over a range of wavelengths of at least two-hundred to seven-hundred nanometers;

x) at least one thereof comprises:

an element made of a selection from the group consisting of:

CaF_2; and
fused silica;

y) at least one thereof:

is made of two elements, one of said elements being made of fused silica and the other of CaF_2;

z) at least one thereof comprises:

a converging element selected from the group consisting of:

a positive miniscus;
an asymetric convex;

and/or a diverging element selected from the group consisting of:

a negative miniscus;
an asymetric concave.

12. (original): A system as in Claim 1 which is present in a Chamber configured as a selection from the group consisting of:

it comprises at least one chamber region in which is present polarization state generator comprising component(s) prior to said material system, said material system, and polarization state detector comprising component(s) after said material system;

it comprises at least three chamber regions, in one of which is present polarization state generator comprising component(s) prior to said material system, in the second of which is present the material system and in the third of which is present polarization state detector comprising component(s) after said material system;

it comprises at least two chamber regions, in one of which is present polarization state generator comprising component(s) prior to said material system and said material system, and in the second of which is present polarization state detector comprising component(s) after said material system;

it comprises at least two chamber regions, in one of which is present polarization state generator comprising component(s) prior to said material system, and in the second of which is present polarization state detector comprising component(s) after said material system and said material system.

13. (original): A system as in Claim 5 which is present in a Chamber configured as a selection from the group consisting of:

it comprises at least one chamber region in which is present polarization state generator comprising component(s) prior to said material system, said material system, and polarization state detector comprising component(s) after said material system;

it comprises at least three chamber regions, in one of which is present polarization state generator comprising component(s) prior to said material system, in the second of which is present the material system and in the third of which is present polarization state detector comprising component(s) after said material system;

it comprises at least two chamber regions, in one of which is present polarization state generator comprising component(s) prior to said material system and said material system, and in the second of which is present polarization state detector comprising component(s) after said material system;

it comprises at least two chamber regions, in one of which is present polarization state generator comprising component(s) prior to said material system, and in the second of which is present polarization state detector comprising component(s) after said material system and said material system.

14. (original): A system as in Claim 8 which is present in a Chamber configured as a selection from the group consisting of:

it comprises at least one chamber region in which is present polarization state generator comprising component(s) prior to said material system, said material system, and polarization state detector comprising component(s) after said material system;

it comprises at least three chamber regions, in one of which is present polarization state generator comprising component(s) prior to said material system, in the second of which is present the material system and in the third of which is present polarization state detector comprising component(s) after said material system;

it comprises at least two chamber regions, in one of which is present polarization state generator comprising component(s) prior to said material system and said material system, and in the second of which is present polarization state detector comprising component(s) after said material system;

it comprises at least two chamber regions, in one of which is present polarization state generator comprising component(s) prior to said material system, and in the second of which is present polarization state detector comprising component(s) after said material system and said material system.

15. (original): A system as in Claim 10 which is present in a Chamber configured as a selection from the group consisting of:

it comprises at least one chamber region in which is present polarization state generator comprising component(s) prior to

said material system, said material system, and polarization state detector comprising component(s) after said material system;

it comprises at least three chamber regions, in one of which is present polarization state generator comprising component(s) prior to said material system, in the second of which is present the material system and in the third of which is present polarization state detector comprising component(s) after said material system;

it comprises at least two chamber regions, in one of which is present polarization state generator comprising component(s) prior to said material system and said material system, and in the second of which is present polarization state detector comprising component(s) after said material system;

it comprises at least two chamber regions, in one of which is present polarization state generator comprising component(s) prior to said material system, and in the second of which is present polarization state detector comprising component(s) after said material system and said material system.